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the Approach

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THE NAVAL AVIATION SAFETY REVIEW

The Approach

THE NAVAL AVIATION SAFETY REVIEW

SEPTEMBER 1955
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Summer's fadin' fast, and it's about time to be thinkin' of the coming winter. Real hot pilots know their winter operations procedure cold, and we do mean cold. Next month's *Approach* will feature many aspects of winter ops. Watch for "The Cold War"...

The printing of this publication has been approved by the Director of the Bureau of the Budget, 9 Dec 1954. This periodical contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders or directives unless so stated. Material extracted from Aircraft Accident Reports, OpNav Form 3750–1 and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Names used in accident stories are fictitious unless stated otherwise. Photo Credit: Official Navy or as credited. Original articles may be reprinted with permission. Contributions are welcome as are comments and criticisms. Address all correspondence to Director, U. S. Naval Aviation Safety Center, NAS Norfolk, Va.

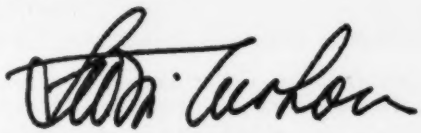
VICE ADMIRAL F. W. McMAHON, USN
COMMANDER AIR FORCE, U. S. ATLANTIC FLEET

Flight safety, combat readiness and effective mission performance go hand-in-hand. Each is enhanced by providing the best possible management of all the factors involved in flight operations. ***The Approach*** will contribute effectively to such management by the consistently high caliber of material presented in its pages.

The complexity of military aircraft requires the utilization of highly skilled operators and support technicians—individuals with professional pride, initiative and integrity. Through media such as this, flight safety efforts are now directed toward these people.

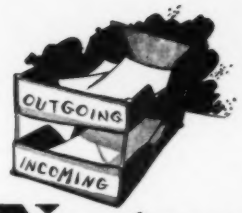
While flight safety is a matter of immediate concern to flying personnel it must also be of concern to ground personnel. It is necessary to impress upon all aviation personnel that our basic duty is to ensure the successful accomplishment of our over-all flying mission. In this regard it is gratifying to note that two sections of ***The Approach*** are dedicated to aero-medical aspects of aviation and maintenance.

In order that maximum benefit be realized, I urge all personnel to contribute ideas, articles and items that will increase the effectiveness of this magazine and consequently our flight safety program.



F. W. McMAHON

Excerpts from the minutes of recent aviation safety council meetings . . .



Safety Council Notes

CONSOLIDATED COUNCIL, WHIDBEY AREA—The maintenance and material committee made the following recommendations to prevent accidental rocket firings: (1) All rockets should be given a thorough physical inspection prior to loading. (2) A squadron ordnance representative ought to accompany rockets from stowage points to airplane to insure smooth handling. (3) A kit, equipped with a safety wire to secure SCAR adapters, comes with each rocket. Each safety wire belongs to a particular rocket, and it is imperative that they not be switched. Squadron maintenance officers should become thoroughly familiar with these adapters.

FLOGWINGLANT/CONTINENTAL—To aid in complete and accurate preparation of an Aircraft Accident Report, it was recommended by VR-32 that the pilot involved remain a reasonable length of time at the naval activity that is compiling the accident data. In addition, whenever possible, a qualified squadron representative should be sent to the scene to assist local authorities.

NORTHERN COUNCIL (COMFAIRQUONSET) — In the discussion of a AD-5 stall/spin accident, the council recommended that the safety officer review past accidents of the AD-5 type aircraft for significant factors. (Ed. Note: An AD Accident Research Report, prepared by the Aviation Safety Center is expected to be distributed by the time this note reaches the reader.)

AIR FMF PAC—Pilots should be impressed with the point that during marginal weather conditions they should utilize *standard* entry, approach and landing techniques, and that the decision to proceed to an alternate field must be made prior to low altitude maneuvers.

FLOGWINGPAC—It was recommended that six ferry pilots be assigned the additional collateral duty of flight safety investigator to aid in the investigation of accidents that occur "on the road." They will also investigate reports of incidents involving safety of flight.

CONSOLIDATED COUNCIL, SAN DIEGO AREA—The ComAirPac aviation safety officer emphasized that safety, not speed was paramount during carrier qualification landings. Other factors affecting safety which were cited: pilots' landing technique after the cut; the exercising of careful judgment by LSOs in giving a wave-off in time to allow the pilot a good margin of safety. It was noted that tailhooks continue to damage flight decks, contributing to subsequent breaking of hookpoints and resulting barrier crashes. This problem can only be solved by constant work on the part of ship's force personnel to repair damaged decks as quickly as practicable.

NAVAL AIR BASIC TRAINING COMMAND—A report of "no injury" should not be made by personnel on the ground or near the scene of the accident unless a doctor has made a proper examination. A case in point was noted where Search and Rescue was advised that there was no injury but later the pilot was found to have sustained a fairly serious back injury.

CONSOLIDATED COUNCIL, SAN DIEGO AREA — The need for accurate information in positioning water crashes was pointed out, with emphasis on the responsibility of squadron safety officer to exhaust all possible sources of information. In addition, the desirability of maintaining radio equipment in squadron spaces was discussed. Such equipment could be used in communicating with aircraft experiencing material difficulties. ●

Flight Operations

PRIMER FOR PILOTS—No. 4

Both sweptwing jet jockeys, and drivers of straight wing reciprocals will want to read about aileron reversal and wing divergence—only two of a Pandora's box of aero-dynamic problems lurking in the redline area where aero-elasticity means: *Something's Gotta Give!*

Something's Gotta Give

THE term "elastic limit," as any red-blooded, intelligent individual knows, is the stretching point beyond which things like overloaded girdles and slingshots fail, or bust as the case may be.

Applied to a certain area of flying, elastic limit, as *few* red-blooded intelligent pilots know, can similarly be exceeded to make airplanes come unglued.

This is not good, for when we whistle off into the upper air to do a little mach knocking, we like to think that our swept-winged blowpipe will remain pretty much intact. And it will, colleague, it will, if you'll temper your zest for Sunday-supplement speeds with just a small measure of understanding and respect for certain *things.* These things can be lumped under the terms "aero-elasticity" and "compressibility."

As people began poking into sound barriers and messing around with mach numbers, it became apparent that the intrusion of airplanes into high speed—high altitude domains was not without certain limitations. Applied to individual airplanes, these *things* began happening in the "redline area." The redline area is so named for the speck of red paint which was dabbed on the air-speed meters to indicate "too fast" before the days of mach meters.

For example, the weird effects of aero-elasticity encountered in this redline area causes, in general, four things to happen to your airplane—none of them pretty:

1. **Compressibility Effect** (control, stability and buffet problems)
2. **Aileron Reversal**
3. **Destructive Flutter**
4. **Wing Divergence**

For you wind machine drivers, these four *things* are pilot poison. You might say they

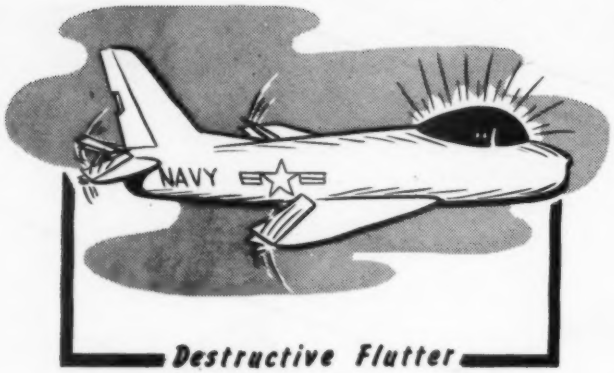


Fig. 1

Something's Gotta Give
(Continued)

occur in an area bounded on the north and south by ignorance, on the east and west by carelessness and bordered on the near side by a big fat red line on your Vg diagram.

Compressibility Effect

In the language of the layman, compressibility effect comes about when a shock wave has formed, or is starting to form on some portion of the structure of your airplane. This shock wave is interfering with, or is going to interfere with the effectiveness of the controls of your buzz buggy, and you're going to have troubles, king-sized.

These shock waves can start on the wing or canopy, or a rivet head, or at some change in the cross-section of the fuselage in what is known as *local mach effect*. Well, the local mach effect, and the shock waves originating therefrom are of rather small consequence in present high performance aircraft. But in medium performance aircraft, when local mach effect begins to form local shock waves, you are very close to a *major* shock wave forming over your airfoil, and this is the point where tuck or pitch gets into the act.

You old Hosenose drivers will remember how the old bentwing would, at altitude and sufficient speed, begin to tuck under when you inadvertently barged into compressibility. That was tuck, and could be rather hairy if you trimmed in lots of back tab which had the belated effect of rivet popping and structure straining when normal control was regained. The problem of pitch, or nose-up reaction is a much simpler matter as the airplane, on pitching up, very quickly moves out of the trouble area.

It's a Mach Problem

Bear in mind that this is a mach problem; not necessarily a true airspeed problem, or an indicated airspeed problem, but a mach number problem.

We have a lot of airplanes which are unrestricted at high altitude with regard to the mach because you can ease them right through it. But at lower altitude, at higher IAS, the compressibility effects are much worse because of the high IAS at which you reach the mach. Also, pulling G will just increase the severity of the problem and can get you into compressibility at a lower mach than might result from 1G. In short, as the G gets higher, the redline speed gets lower — just as will your chances for drawing social security diminish if you try to mix the two. People just naturally get into trouble by get-

Fig. 2

ting in the *1G* redline and pulling more G and winding up with a buffet problem.

Aileron Reversal

This matter of aileron reversal is a study in contradictions, as anyone who ever experienced it can tell you. Say you're tooling along, in the redline zone, with just a normal 1G showing, mind you, and you shove the stick over to the left for a port turn. So what does the airplane do but roll itself into a *right* turn, leaving you just the slightest bit confused about these mulish machines. Now don't hit the panic button yet; just throttle back, pop some speed brakes (extend some garbage, as some put it) and let's look at what happened. (Fig. 3).

You were nudging the redline speed on your cloudhopper, remember? Now, as you're boring through the blue, with no aileron control applied at all, your wing is subject to a down pitching moment if the airfoil has any camber. But just you roll in some aileron and the pitching moment (or torsion) can be up *or* down due to aileron displacement.

Fig. 3

It works this way: roll in a bit of *down* aileron on one wing at redline speed and a considerable force immediately acts against that aileron to force it and the adjacent wing area *upward*. This results in a twisting effect on the wing which bends the leading edge *down*, and vice versa for the *up* aileron.

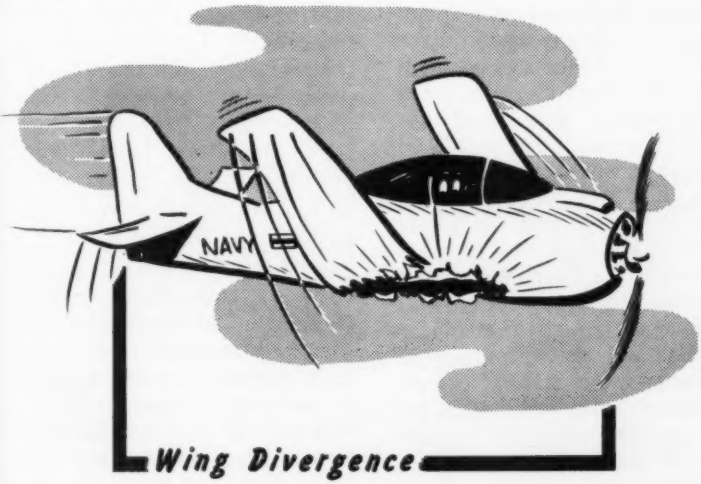
In times past, airplane designers have been able to beef up the wing structure to take care of most any twisting effect the wing might encounter. However, as speeds increased, it was obvious that the only way to prevent this twisting due to the pitching moment of the wing from deflected aileron, particularly near the wingtip, would be to build the wing like an anvil. But if you build an airplane like an anvil, it'll fly like an anvil.

So, in spite of a very fine strength factor built into our new airplanes, there still remains the twisting moment which tends to bend the leading edge of the wingtip up or down according to aileron deflection.

At redline speed, straight and level so far as ailerons are concerned, the wing at this point is about ready to toss in the towel. If at this time you roll in left stick for a left bank, the right aileron dropping into the airstream causes the right wing to groan "that does it!" and the right wingtip is twisted down to give a lift down instead of up.

In other words, it gives a lift change contrary to what we are controlled for. You see,

Fig. 4



AD and T–28 drivers should know that wing divergence is most common in straight wing aircraft.

Something's Gotta Give
(Continued)

we put our right aileron down, that causes the wing to twist leading edge down to give a lift down on that side. It also works the reverse way on the left wing. Left aileron there tends to twist the wing leading edge up and give us a lift up instead of down. Result: A perplexed pilot sitting there with a mess of ineffective aileron on his hands. Remedy: Come back outta that redline zone before you reach the original point of no return. All this is a high indicated airspeed problem, and the approach to aileron reversal may give some warning, but not very much. For the record, sweptwing aircraft are more susceptible to aileron reversal than straight wing aircraft.

Destructive Flutter

Destructive flutter, in a word, is Buzzzz. It occurs in any of the aerodynamic surfaces on the aircraft; you can have it on the wing, the empennage or in fact *any* place on any aerodynamic surface on the airplane but it usually starts on one or all of the control surfaces. It results from a high frequency oscillation of those surfaces excited by the airstream at high speed. Ever see a venetian blind slat flutter in a strong breeze? That was a form of Buzzzz—a mild form.

In airplanes, the flutter comes about when the control surfaces bend up and down very rapidly. And what happens to metal when you bend it up and down rapidly? Uh, huh, just like an office paper clip breaks in two when you bend it—except that in this instance, it's your *office* that's ready to break up. (Fig. 1).

Beyond the redline, flutter begins and the amplitude of these aerodynamic excited oscillations (Howja like that little gem?) build up to, you should excuse the word, "disintegration," and that happens very *very* rapidly. Especially if the airplane is accelerating, which gives it a critical flutter speed and the airplane, along with any cockpit citizen, will go to pot—period.

Time was when most of this buzzing effect was pretty readily detectable by the pilot on account of he was directly connected to the controls with control wires and such from the control stick. Nowadays, though, the driver has no such physical contact with the control surfaces, he just pushes them around by valving hydraulic pressure to pistons. So he isn't as sensitive to the flutter as he once was.

Fortunately, however, in most aircraft there remain plain old fashioned wires to the rudder, and the buzz transmitted from the rudder to your feet by the control cables will tell you that it's time to pop the speed brakes and haul off some of that go handle

before you Buzzzzzzz right out of this world.

Again, the trouble began when you began nosing into that ever-loving redline speed, and again, the only positive answer is: Don't!

Wing Divergence

Wing divergence—now there's a real nasty sounding hunk of terminology, and believe you us, it's even nastier than it sounds. This caper can put you in the past tense before you can say "next of kin."

Observe: Wing divergence occurs because a given wing can take just so much stress acting upon it in this manner: There's upward stress, from the lift; there's backward stress that tends to pull the wings backwards, and both of these are pretty well licked by design. Then there's torsional, tip-bending stress that tends to twist the wingtips (See Fig. 4). This twist causes them to dig in and this dig-in bends the wings up or down. That's right, up or down— and *all the way*. Wing divergence, friends, is strictly a one-shot deal—there's no vibration, no buffet, no shudder, it just starts bending and twisting and the wings are gone.

Again, let's say you've gone messing around in that redline zone, sort of moth-to-the-candle like. The process of wing divergence can be seen like so: If a wing at high indicated airspeed encounters a slight updraft due to turbulence, there is generated a slight uplift which causes a momentary increase of lift; next, this momentary increase in lift causes the wing to deflect upward giving further increased angle of attack; this increased angle of attack gives more lift, which is more deflection, which is more angle of attack, which is more lift, until failure, when the wing *diverges*.

That means the wing went wham! bam! and was no longer a part of the airframe. The wings just went up and back like a swan diver's arms. But don't bother to begin worrying now—you just became "was" from the shock of the divergence.

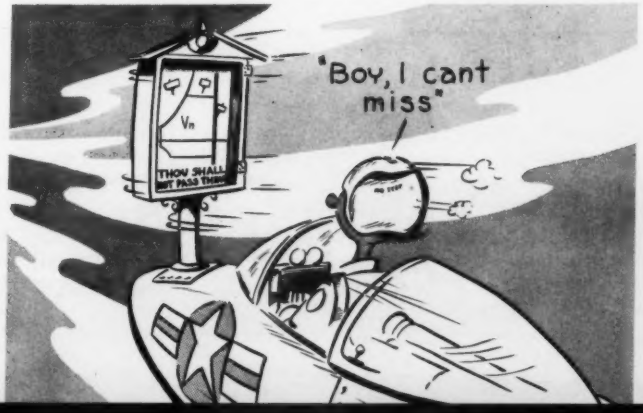
You T-28, AD drivers should know that wing divergence is most common to straight wing airplanes. Sweptback wings have a stabilizing effect for this situation. (You get more of the problem of aileron reversal in the sweptwing type.)

If by now you are still unimpressed by the nature of the *things* which lurk in the redline area, be advised that your curious or heedless probing into this region can flip the lid on a Pandora's Box of aeroelasticity and compressibility troubles which could flip you smack into the obituary column.

So, to avoid any possibility of *that* conclusion, consider this conclusion: Recognize the limitations of your aircraft; respect the redline speeds assigned by the people who built the machine; operate within the airplane's performance envelope and in accordance with the pilot's handbook and you've got it locked. Horse around in the marginal areas and brother, you never had it so wild!

This is the fourth in a series of articles discussing critical areas of flight. The most recent of these, discussing the closely related Vg diagram (envelope), appeared in the July 1955 issue of The Approach.

Operate within your aircraft's Vg envelope and you've got it locked.



Our thanks to LTCOL Sam Folsom, USMC, author of this unique article on the wheels-up landing problem.

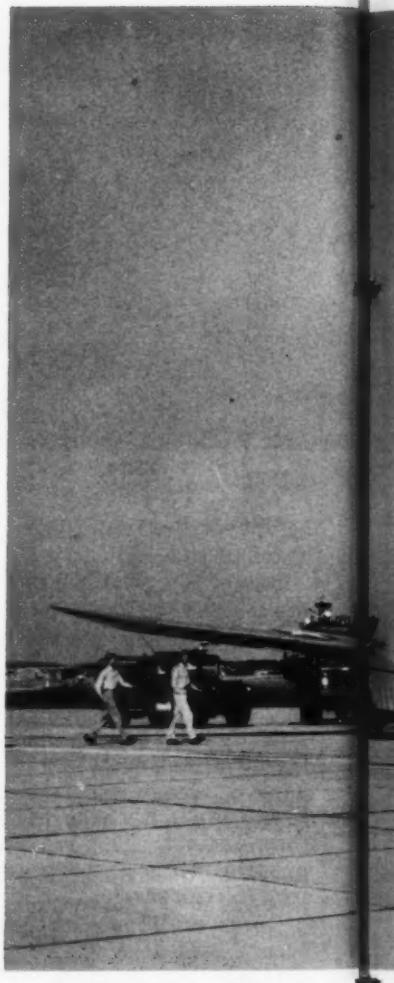
Wheels!

IN SOME dim lost age, the first wheel appeared.

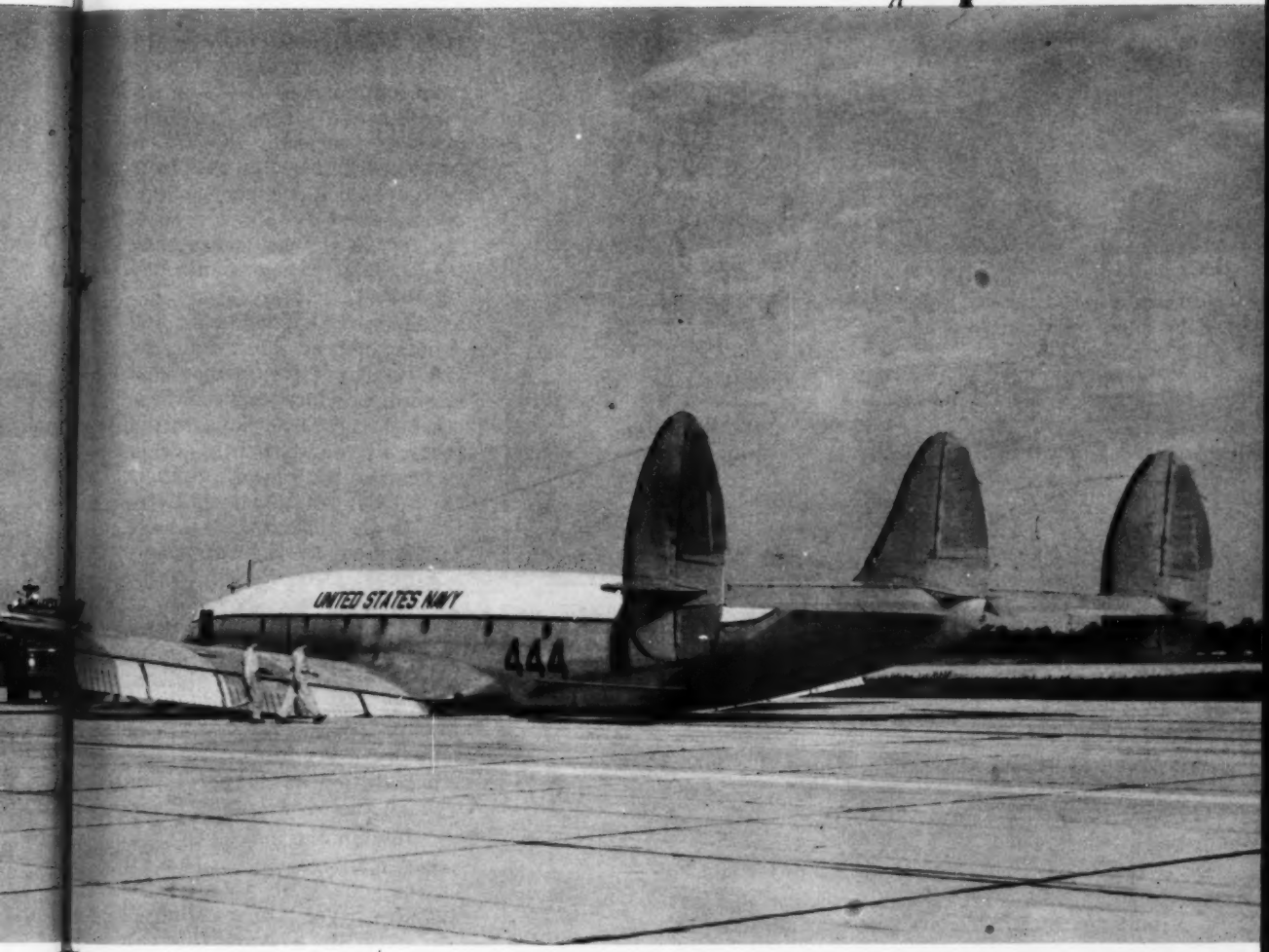
A Stone Age Henry Ford cut a cross-section from a tree, beheld its transport possibilities, and set himself up in business. He was probably slain for his efforts by a local protector of the status quo but his invention lived on and, as is the wont of such gadgets, developed with the passing years. Darius The Great, it is said, employed the wheel not only to move his war chariots, but also added suitable revolving blades to mow down his foes. The Hindus saw its potential on the car of the Juggernaut as a sacrificial implement and religiously threw themselves into a rotating eternity.

Americans further developed its lethal potential on the horseless carriage where, although encased in rubber and cushioned with air, it put its prototypes to shame as a tool of destruction. Man learned to roll—as we see, quite frequently over his fellow man. Having learned to roll, he learned to fly, and having learned to fly he attached the wheel to a wing, and the modern aircraft was born.

This was quite a satisfactory arrangement — each wheel was attached firmly to a strut which in turn maintained a fixed displacement between the aircraft and the ground—in all normal landing attitudes. Occasionally some Dilbert of the Roaring Twenties would land inverted but this was hardly attributable to any fatal tendencies of the wheel itself. All groundloops notwithstanding, the terrible wheel had been removed from its bloody domain—man had conquered—man had domesticated this monster of his creation—for a time.



The bloodthirsty circle would not be denied for long however—like the cobra it hypnotized man's weak mind and under its spell he developed retractable gear. Some poor unthinking engineer with progress as his goal—stream-



lined the wheel right back into the headlines. What goes up must come down applied to the air carrier of the wheel—it did not apply to the wheel itself, as may be witnessed even now most any sunny afternoon at your local air station. The landscape was soon cluttered with bellyborne sky cars that returned to their nests with all the grace of legless sparrows. Old pilots—bold pilots—hot pilots—cold pilots—embryos and aces cut up the bases and with shiny red faces found themselves disgraces. The wheel was master again.

Man fought back valiantly. Every imaginable type of pilot reminder was tried—in the planes and on the ground. Nice little clock faces that pictured wheel positions were placed right in front of the pilot's eyes — raucous horns blasted his ears—boot seamen fired flares in his face and wheel position landing reports

Almost every model aircraft has fallen victim to the wheels-up landing plague. In FY '55 there were 61 major wheels-up landing accidents caused by pilot error.

Wheels *(Continued)*

were required. It was all magnificently mechanical—eyes looked at but did not see nice little clock faces—ears listened to but did not hear raucous horns—boot seamen fired flares in wrong directions or slept peacefully like fallen warriors under wind tees (one was even run over as he slumbered thusly)—pilots reported, but knew not what they said. The carnage continued unabated.

Aircraft that could fly 700 knots replaced those that flew 150 knots—aircraft that cost 2 million dollars replaced those that cost 50,000 dollars and they all found their place in a heap on the runway as their 100-dollar wheels played Lorelei to 20th Century seamen. An annual average of nearly 75 naval aircraft climb these proverbial rocks in quest of the fair maidens—all are damaged—many require major overhaul—some are strikes; but the warning systems developed in the early years of the hidden wheel stand fast in imitation of the perfection which they represent.

Now no one may ever tame this mad wheel so that it meekly descends to meet the earth—never taking refuge in its cave. It's a sly cur that can never be trusted, but, after all, we are men! Our kind have walked amongst lions, dived into the bottomless sea, scaled the heights of mighty Everest, slid matter of factly over the poles, and in the guise of Dodgers even faced the terrible Yanks. Are such as we to submit to this vicious circle?

What do you say men? ●

The theme of this issue is to induce "all hands" to report incidents by submitting Anymouse Reports. This is one answer to getting the word out on safety.

Anymouse's Anniversary

WITH this issue Anymouse celebrates his second anniversary of duty with the Aviation Safety Center. Born some eight years ago in VR-31, the original idea of submitting anonymous reports is credited to *LCDR Trygve A. Holl,* USN, safety officer of that squadron.

Since reporting to the Aviation Safety Center in 1953, Anymouse and his many cousins scattered throughout naval aviation have busied themselves most encouragingly.

Officially, the word Anymouse designates a form available to Navy and Marine Corps personnel for reporting, anonymously, near - accidents or incidents which might have led to aircraft accidents of a more serious nature. These hairy tales, submitted by nameless airmen, provided a means for pilots and crewmen to gain valuable knowledge from the experience of others.

Many Reports Received

How has Anymouse prospered? "Any" can grin proudly over just a few statistics: To date there have been over 400 of these candid confessions which usually begin with "There I was . . . ," and which invariably close with a fervent "never agin!" note of wisdom. Involved in the accounts have been some 36 different model aircraft; an impressive number of air stations and facilities, not to overlook a generous coverage of carriers.

In particular aircraft, the F9F leads in the number of reports (59) with the F2H *Banshee* a close second with 40 reports. In close order thereafter are represented the SNB and the AD.

Some of the reports gripe about inadequacies of certain

components or procedures. Others blushingly admit personal mistakes and analyze their actions in close situations. Many reported maintenance discrepancies which caused hair-raising moments. All displayed individual initiative and professional consideration in taking time to submit an Anymouse Report. The value in lives saved and damage to property prevented can only be guessed from the occasional reports received of positive saves resulting from Anymouse information.

One pilot expressed it this way. "This Anymouse business is all right as never before could a man admit he had a close one, yet not hurt his career and at the same time help to save lives and aircraft. Long live Anymouse!"

Anymouse in Action

In troubleshooting Anymouse reports have proved their worth. Because of the nature of the reports, many saves are not credited to the Anymouse system. But some of his work has been acknowledged specifically. For instance an omission of certain instructions in the pilot's flight handbook of a jet fighter was noted. The report got official attention and action was promptly taken to correct the deficiency.

One Anymouse reported an undesirable feature of the control stick in a particular model aircraft. This was also given official attention for consideration in redesigning the stick. Then came an Anymouse report on a hazardous runup condition existing at a naval air station. The CO of the station was advised and immediate action eliminated the hazard.

In another instance, a report of a small flash explosion in an oxygen mask interested an officer in BuAer and through his efforts a thorough investigation was made. The incident had happened before and was being blamed on poor maintenance. The real trouble was discovered in the cockpit microphone receptacle. It had been modified by the contractor and allowed the plug and receptacle to be connected wrong. A field change was issued as an interim to the contractor's engineering change.

All reports received have not been printed as yet, though many have been published in *The Approach* and other reports issued by NASC. However all reports received are

"AND THERE I WAS . . .", says the typical Anymouse report. Every pilot has been in a hairy situation at one time or another. Send us yours so that others might benefit.

analyzed for use in research studies and many requiring action are handled through personal phone calls, letters or become the subject of an article or research project. Tentative plans have been made to publish the majority of the Anymouse reports in a series of digests beginning in the near future.

Others Use System

The value of Anymouse reporting has been recognized by both the United States Air Force and several of its commands, as well as certain commercial airlines who have adopted similar systems of incident reporting.

Anymouse blanks are available on every carrier and air station. Reports can be submitted by personal letter or memorandum as well. If the supply of forms in your squadron or base is running low, send a formal or informal request for more copies to the Naval Aviation Safety Center, NAS, Norfolk, Virginia.

As one poetic Anymouse said:

"Cut the 'axe' out of accident
with the 'in' it's an incident.
The difference is an Any-
mouse
Send us yours. It's worth
your life."

To Anymouse, that sage of the skyways whose hard-earned wisdom has been a positive contribution to safety in naval aviation, birthday greetings, Well Done, and happy landings without incident!

But if you should have an Anymouse type experience, just take a pencil and

SUBMIT AN ANYMOUSE,
and save a life! ●

Anymouse reports have been received covering a great variety of situations. Some of these, and the number of each type incident, are:

Turbulent weather and thunderstorms	**25**
Material failure and maintenance	**59**
Inadvertent operation of cockpit controls	**30**
Takeoff situations	**47**
Near wheels-up landings	**11**
Near mid-air collisions	**18**
Communication difficulties	**31**
Taxiing	**17**
Flameouts, airstarts and dead-stick landings	**13**
Oxygen experience and systems	**17**
Preflight laxity	**21**
Carrier takeoffs and landings	**16**

Share your experience . . . send in an ANYMOUSE report. Blanks are available in all NAS and CV operations offices, ready rooms and line shacks. If you don't have a form, just write it on any stationery and address to

U. S. Naval Aviation Safety Center
U. S. Naval Air Station
Norfolk 11, Virginia

Anymouse

and his hairy tales

IT'S THE LITTLE THINGS

Anymouse was cavorting amongst the thunderheads on a night intercept hop in a *Banshee* which had seen better days. However, despite some low visibility and occasional rain squalls no particular difficulty was anticipated during recovery.

About 20 minutes before Charlie Time, Anymouse experienced aileron boost failure when the circuit breaker popped, popped again on being reset, and thereafter was left discretely out. No sweat there, for though Anymouse hadn't made a no-boost landing before, it wasn't uncommon and involved little more than a long final. So with the time remaining, Anymouse busied himself with checking the feel of the airplane at lower speeds, assuring himself that even his stringy muscles were adequate for the task.

About this time he observed his left corner instrument panel lights go out. No reason, they just stopped working. And of course the emergency floods proved inoperative. This left Anymouse somewhat in the dark as to what his airspeed, altimeter and RPM might be. Then he discovered that the control rheostat knob to his other instrument lights had disappeared, leaving an unmovable shaft. Ah, well, just have to use the ol' flashlight a little more often.

Anymouse called home to the carrier, which was poking its way through an area of scattered showers, eased on down, tooled by the ship and dropped his hook handle—and squinted in considerable dismay as the light in the hook handle remained on. It focused a rather brilliant beam into his eye, advising that a possible no hook situation existed. Up hook, down hook, same result, same light. Coulda sworn he felt the hook chunk down properly, but have to make a hook check pass to be sure. Nothing to get excited over.

Upwind, an easy instrument turn, gear down (*that* item did work!) roll back out on the straightway—and the darn airplane tried to roll right over on its back. Frantic muscling of the stick to slop back level, thumb jabbing the aileron trim knob—oops! No knob! Trim had run completely right wing-down and the ever-loving knob had fallen off . . . Glove off, finger probing urgently to activate the tab—no dice, too far recessed in the stick.

Anymouse continued downwind, with knee pressure assisting both hands on stick, and taking occasional hasty stabs of flashlight at airspeed,

altimeter and RPM — each glimpse revealing either too much or too little of something.

WOW! That was the reflection of the wing lights on the water! Vroooooom, go the engines. Whew, must look like a porpoise on a pogo stick. Abeam now. Not *too* low—probably higher'n a kite, and I *like* it! Begin easy turn in—oops, not too much, stupid. Chug up the wake for a hook check, boy.

What in the . . . ! Another plane cutting me out on a normal approach. Left hand off stick momentarily for a fast transmission: "Getthatdamplaneouttamywayican'tridehis slipstream!"

A cheerful voice came from the ship: "Roger, he's just making a hook pass." The other pilot, bless him, elects to go around. Anymouse wobbles by the LSO platform. "Hook is down." Back up ahead of ship for a very, *very* gentle turn . . . Now down the stretch; deep approach, chugging up the wake with rain streaking canopy.

Well, I'm a sad cookie . . . *Another* plane cutting me out! Go around again.

Upwind, tuuurrn, down, wind. Leg muscles jumping and arms aching in every bony joint. Oh, to have been a preflight product! Approach groove, long. Getting slants from LSO, but can't take 'em—blasted airplane is just aching to join the sub service . . . Crabbing to come out lined up with ramp. T'aint orthodox and if I don't answer a slant, ol' Paddle's gonna wave me off but quick. Try one itsy bitsy one. Yipe! Brace and pull the wing up.

At the ramp—lined up—there was the cut—I think. Cut, schmut, here I go. Took a mad stab to whack off the throttles, and get my hand back to stick. Whoops! Darn near rolled again, haul her up, now we're lined up and down we go. Come on, dadburnit! Forgot the book—this time you gotta flare! Brace yourself, we'll probably drive this one into the wardroom.

Ka-wump! Whatta you know! I've hit harder during daylight!

Whooie. Taxi forward. Down number one. Now the reaction—the slow burn really begins to sizzle. Then the payoff: the plane captain bustles up innocently to inquire "Is the plane Up?" ●

MIKE FAILURE

"On climbout in an F9F-5 Anymouse's oxygen mask mike failed, leaving him with a decision as to whether or not to continue his 500-mile cross-country, using boom mike for transmissions, or return to base.

Weather and cockpit pressurization were good and he decided to continue, descending to a lower altitude if flight safety was endangered. From previous low pressure chamber experience Anymouse believed his reaction to hypoxia was panic first, without the usual hail and hearty drunk stage.

"Nearing the final part of the climbout," he said, "several extra transmissions were necessary in order to clear up a miscalculation by ground personnel. I had to fly with my knees of course, while transmitting, holding my mask away from my face with my left hand and shoving the boom mike in place with my right. As I ascended and control became more sloppy I proceeded to do mild acrobatics when using my knees.

"Due to the rarefied air at altitude my transmissions became very weak and I lost radio communication about one-third of my way along. Also the cloud layers built up below me making me doubtful about any unauthorized change of altitude. I gave up trying to communicate anymore until very near my destination when I raised another facility somewhere north of my path. All this time I was on 100 percent and used safety pressure after each unmasking, but I noticed also that the total amount of oxygen used was only 150 pounds. No wonder I felt slightly lousy near the end of the one hour and 20-minute hop.

"The big realization came however, only after I landed safely just how Anymouse I was with neither my brain nor my oxygen regulator working properly.

"It became apparent too, that old hypoxia had me from my climbout (or should I say takeoff) or I would have taken one of several recourses:

1. Turned back and aborted the hop.
2. Request a low altitude immediately upon mike failure.
3. Jeopardized my no-flight-violation record instead of my life and descended anyhow, authorization or no. ●

Anymouse and his Hairy Tales
(Continued)

BEWARE THE QUEEN

From the discrepancies that Anymouse lists, it seems obvious that the airplane in his story had been a hangar queen or dud—that is, one which had been laid up for some time awaiting repairs, like the one pictured here.

Here's Anymouse's story:

"Recently a TV-2 was delivered to this unit. The pilot arrived after normal working hours and proceeded to the BOQ for a night's rest. Before accepting the TV, the maintenance crew conducted an inspection which revealed the following discrepancies:

(1) Nose gear bearings frozen; so heavily coated with rust that the metal couldn't be seen (2) Brake discs so badly corroded that the spring would not release them (3) Safety-of-flight items not worked off: Five Technical Bulletins; Three Aircraft Bulletins not signed off; Five Service Changes not incorporated; 13 Engine Bulletins ranging from No. 76 to 199 A not signed off (4) Condition of the compressor requiring engine overhaul (5) Corrosion and rust of various parts indicated that no major check was completed before transfer of the aircraft."

"When confronted with this list, the pilot said 'There might have been a few safety-of-flights but it sure flies great.' "

Those familiar with the working of a maintenance squadron will understand that this kind of air plane is usually worked on as parts, materials, equipment and manpower become available. Often, part of the work may be divided between O & R and squadron crews.

Such circumstances as these can only make maintenance responsibilities more uncertain and vulnerable to neglect. Further, the flow of essential paperwork is interrupted and often backs up in the administrative pipeline with the result that no one does the additional work as it becomes necessary. Under these conditions, the aircraft is "sold" with only the known existing work orders and inspection items completed. Many of these items are possibly outdated by the time of transfer and all should be re-checked.

To preclude this kind of maintenance, the administration of paperwork in aircraft inspection systems has to be continuous and geared to a system which is as up to date as possible—which must be interpreted as being up to the minute! ●

BEWARE THE QUEEN—she breeds trouble for maintenance.

THE FIRST TIME

Anymouse in an F7U-3 felt a little dizzy at 22,000 feet and at first thought his strange sensation was the result of climbing too fast. At 24,000 feet it finally dawned on him to check his oxygen. He did and the indicator showed no flow.

Anymouse admitted that this was the first time he remembered looking at his indicator and had merely checked to see if his mask was connected to the oxygen tube.

Various positions of the selector switch still indicated no flow and he hurriedly switched to safety pressure. The flow indicator came to the steady flow position though no pressure could be felt in the mask.

"At this point I felt a slight blindness or a graying out effect," said Anymouse. I immediately nosed over and began to feel that everything was all right but realized that this was hypoxia taking hold so I continued down to 10,000 feet.

"Not until I landed did I find that I was mighty lucky to be alive. First of all, my oxygen preflight inspection was limited to turning on the oxygen. The two clamps, one holding the oxygen tube to the seat, the other around quick-disconnect had come loose and the oxygen tube was dangling free in the cockpit.

"I recommend that all pilots know all there is to know about hypoxia and have a pre-flight check, a prior-to-take-off-check and a regular in-flight check of their oxygen equipment. I also recommend that when you feel symptoms of hypoxia use that bailout bottle and come down fast." ●

FIRE! FIRE!

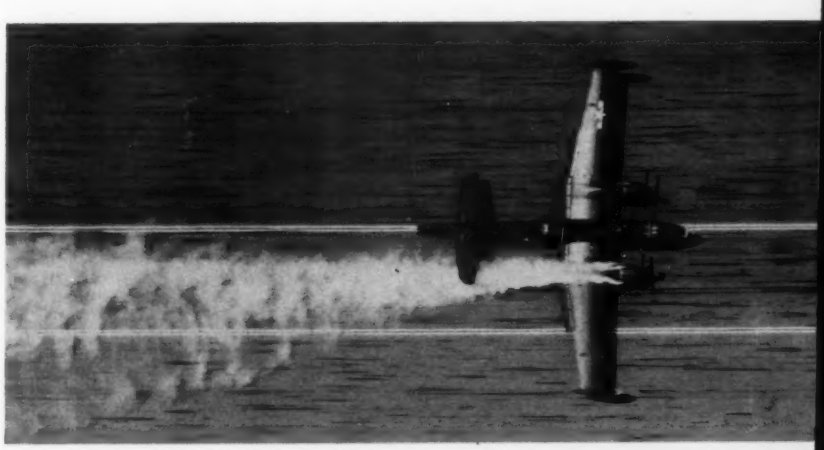
"On my first flight (except a test flight) in a P2V-7 we landed at a civilian field for RON and fuel where fire fighting equipment was at an absolute minimum. Landing was normal but slightly long and I reversed the props to shorten my rollout.

"Coming out of reverse the port engine died, due perhaps to my inexperience and poor handling of the new overhead throttles. When I saw that the engine was gone I also saw a good size fire in all three exhaust stacks on this engine. While braking to a complete stop I tried to start the engine hoping to blow the fire out, but forgot to put the mixture in idle cut-off.

"I was pouring raw fuel into the fire which dropped flaming gasoline to the deck and by the time we were stopped it was a big fire. My wits slowly collecting, I remembered the mixture control and continued cranking the engine still hoping for a miracle. My quick-thinking plane captain was out with two hand fire extinguishers immediately and emptied both, managing to put out the fires on the deck and in both lower stacks. However, the top stack was burning more fiercely all the time and as it looked dangerous to me I ordered everyone to abandon the plane while mentally picturing the AAR. 'Spanking new P2V-7 burns completely'—100 percent pilot error in technique, judgment of suitable landing field, etc.'

"As I was climbing out of my seat I saw that if I could get another extinguisher I might still get that fire out. Before I knew what I was doing I was on the wing and the plane captain who really saved the plane—tossed me a third hand extinguisher. Fortunately we had this extra one in the forward part of the plane.

"Surely this would never have happened had I landed at a military field with adequate fire fighting equipment. It seldom does. I definitely erred in taking a new plane to that field. However, my primary recommendation in this case is that ferry pilots like myself refrain from reversing props on new planes unless they do it often enough to be sure of themselves and their *technique.* *(For information on reversing technique, see page 34 this issue.)* ●



"When I saw the engine was gone I also saw a good sized FIRE in all three exhaust stacks."

Truth and Consequences

A DIGEST OF RECENT AIRCRAFT ACCIDENTS

VA

AJ

HARD LANDING—Rain squalls were approaching the field from the southwest and the AJ pilot first stated he would remain clear until the field was VFR. As the tower advised they were still VFR with the rain squall one mile distant, the pilot elected to enter the pattern and land. Clearance was given for runway one three with winds variable southeast to 10 and gusts to 20.

As the aircraft turned onto final the rain shower had just started to hit the runway with winds from the southwest. Power was reduced to 15 inches with full flaps used and 115 knots airspeed maintained.

Ground observers lost sight of the aircraft as it came over the boundary due to limited visibility caused by the heavy rain squall.

The aircraft landed heavily in a nose-high, left-wing-down attitude and began breaking up. It swerved off the runway to the left and came to a rest after a distance of 510 feet. The picture above shows the extensive damage to the aircraft.

The accident board pointed out that reduced visibility under precipitation conditions is a characteristic of the AJ and that the pilot erred in attempting to make a power-off approach under existing conditions. It should serve additionally to stress to all pilots the dangers inherent in landings or takeoffs in the close vicinity of squalls or thunderstorms.

The board further pointed out that during any precipitation the AJ flareout point is extremely hard to judge which caused the pilot to stall the aircraft from an undetermined altitude. ●

AD

LOW-LEVEL NAVIGATION—The mission was a low-level navigation problem involving two ADs in overseas mountainous terrain. The point of turn was correctly reached and the flight turned north. However the turn was initiated 10 miles or about three minutes flying time prior to the next DR position, and the flight entered a valley which narrowed rapidly and terrain clearance decreased quickly. A climb was initiated and one plane, an AD-6, managed to clear the ridge tops at the end of the valley. The other, an AD-4N, failed to climb as rapidly and the pilot completed 90 degrees of a 180-degree turn before his aircraft stalled and struck a hillside. Fire followed the impact and there were no survivors.

In reviewing the accident the wingman stated, "Airspeed and altitude are the two primary safety factors in flying. In low-level flying, one of these factors is given up. Lack of altitude makes navigation difficult, decreases visibility by coating windscreens with salt over water and insects over land, makes bailout impossible and successful ditching improbable in case of engine failure, and birds become a constant hazard.

". . . Lack of knowledge is the only danger that can be eliminated without compromising the training value of flying in peacetime." ●

AD

FLY-BY CRASH — Four ADs completed a simulated close air support mission and the flight leader requested and received clearance from the tower to make a low-level formation pass over the flight line. The run was made towards rising ground and into the direction of the sun, which was approximately 30 degrees above the horizon.

During the pass the flight leader's port wingman flew a close, step-down position which became unsafe as his starboard wingtip moved under the lead plane's port elevator. Attempting to widen out the wingman struck the flight leader's tail surface and forced the lead aircraft into a nose-down position. Recovery was not possible due to the extreme low altitude at which the initial collision occurred.

Damage to the wingman's aircraft was minor and a successful landing was made.

Primary cause of the accident was the flight leader's decision to take his flight into a dangerous situation by descending to an extremely low altitude into rising terrain.

The condition was further aggravated by the lack of briefing for this type maneuver. Secondary cause was assigned to the wingman due to his failure to maintain a proper and safe wing position. It was pointed out that low altitude flying should be done only when scheduled. Even then it is dangerous and should be treated accordingly. ●

AD

EXTRA CURRICULAR—Completing a scheduled instrument hop two AD-5s engaged in a tail chase. At the bottom of a column loop the lead plane was overrun and disintegrated from the impact while the second plane caught fire and went into a flat spin. The one survivor was a crewman who chuted to safety after being thrown clear.

Both pilots were six weeks out of flight training, had less than 25 hours in model and neither of them had flown any scheduled aerobatic flights since joining their squadrons.

Poor visibility to the right and down in the AD-5 was felt to be a contributing factor though pilot error for participating in unauthorized maneuvers and exceeding their capabilities was assigned the primary cause. ●

EXTRA CURRICULAR flight activities resulted in the mid-air collision simulated above, with the tragic ending in the water below.

VF

F9F

DOUBLE ERROR—Shortly after touchdown the nose of the F9F-5 fell below the normal landing position and the aircraft skidded about 4500 feet on its nose. Wheels had been reported down and locked and the wheels watch had given a Roger all the way. The pilot received no bodily injury.

The accident board noted that when the battery switch was turned on after the accident (it had been turned off by the pilot during the slide-out) the landing gear indicator showed a safe condition for the main gear and a barber pole for the nose gear. Also the main gear doors were still extended.

It was concluded that the pilot actuated too many items of the hydraulic system in a short interval causing retarded gear operation and that he did not make a positive visual check of gear indications. The wheel watch in this case had been assigned two weeks previously and by his own admission had no aeronautical experience. Several days observation with an experienced man was recommended for personnel assigned to wheels watch duty. ●

A DOUBLE ERROR by pilot and wheels watch lead to this accident.

F2H

PANIC BUTTON—On an F2H-3 electrical system test hop, the pilot experienced difficulty during a daytime takeoff. When the aircraft required more than the usual right rudder, the pilot considered aborting takeoff. On becoming airborne, he assumed the difficulty was with the rudder, and, so in considerable distress, declared an emergency, and made a quick pattern for landing. The pilot made a high, fast no-flaps approach, landing halfway down the runway.

The aircraft lost its landing gear and received strike damage in the rough terrain of the overrun. Only injury to the pilot occurred when he jumped from the aircraft after it stopped on the ground.

Investigation revealed that the aircraft had no apparent malfunction or discrepancies, except that five degrees left rudder tab was set on the indicator. However, the pilot reported that he was scared from the time of first trouble until landing.

The pilot's state is apparently the explanation for the following errors of the pilot. He failed to calmly investigate his assumed control difficulty at a safe altitude. He landed with a full fuel load (exceeding limits). He selected a shorter runway, not entirely with wind, when a longer satisfactory alternate runway was available. He neglected to lower flaps, failed to secure engine and fuel switches after the crash. ●

Throw away the PANIC BUTTON—train yourself to calmly investigate flight emergencies.

VP

P5M

LIGHTING STRIKES—Five P5Ms were subjected to slight damage and/or loss of the trailing wire antenna by the effects of lightning striking the airplane.

While it is indicated by BuAer that limited corrective action can be taken to minimize the hazard and damage from incidents of this type, the development of preventive action has been delayed by the apparent lack of timely reporting by those activities experiencing these incidents.

For this reason, the Aviation Safety Center wishes to emphasize the importance of reporting incidents of this and similar occurrences in order that the information may properly be evaluated.

Pending dissemination of complete information on the subject, an informal survey of measures presently in use by some flight activities offers the following items:

(*a*) In one instance, included by VP-44 in a trouble report to the aircraft manufacturer, the pilot related that a few seconds prior to the flash, a loud frying static build-up was noted in the HF receiver.

(*b*) Always applicable is the precaution of reeling in the antenna wire before entering thunderstorm areas.

(*c*) As also reported by VP-44, present static discharge wicks may not be assumed to be capable of handling the heavy currents of a lightning flash over discharge. ●

VR

R4Q

SINGLE ENGINE EMERGENCY—Losing an engine, the R4Q changed course for a major field 30 miles away. Weather was given as 200 overcast with visibility five-eighths of a mile in light rain and fog. The aircraft passed over the field on a missed approach due to inaccurate performance of the gyro horizons and difficulties with the ILS glide path receiver.

Radar vectors lined the aircraft up on the same runway after a procedure turn. During this approach altitude was about 300 feet and airspeed 110 knots. The aircraft drifted slightly off course and when runway lights were spotted a left turn of about 30 degrees was made and an immediate landing effected.

A second approach had been set up for runway 25 which was 7000 feet long. However the runway which was sighted and used was runway 19, only 5200 feet long. The touchdown spot allowed only about 2500 feet of runway for stopping and the aircraft rolled off the end of the runway for about 240 feet and down a 30-foot drop. There were no fatalities.

A flight check of the aircraft's ILS receiver, which was installed in another aircraft, revealed faulty operation and it was recommended that a program of flight checks of ILS equipment in squadron aircraft be made monthly. Due to a history of poor gyro horizon performance in the squadron it was recommended that a more reliable instrument be installed; an instrument designed to operate at 180 knots cruise speed. ●

A combination of factors during a SINGLE ENGINE EMERGENCY resulted in this R4Q accident.

Careful consideration of approach technique could have prevented this OVERSHOOT.

NAS

SNB

OVERSHOOT — an SNB was cleared for a GCA approach at an alternate air station with a runway 4000 feet long. The pilot's home station had an 8000-foot runway. On final the plane broke out at 1000 feet altitude a mile from the runway. Landing lights did not function when the switches were pushed down and the pilot continued his approach with 30 degrees flaps.

Glide path point of touchdown was 500 feet from the approach end of the runway but the aircraft did not touch down until 2000 feet from the approach end. Flaps were ordered up. However, the copilot noted the end of the runway coming up and lowered full flaps. Braking action failed to stop the plane and it rolled off the end of the runway at about 40 knots.

The airplane continued on for about 350 feet where it dropped into a road and stopped against the road embankment. Passengers sustained minor injuries, most of which could have been prevented by the use of shoulder straps. No instructions or orders had been issued on their use.

Investigation included a check of threshold lights and material deficiencies in visibility were found, which when coupled with the conditions encountered at the time of the accident, (windshield visibility, wet runway, no landing lights, light wind) contributed to the pilot's failure to realize he was long and fast.

Pilot's comments and recommendations included: (a) have all personnel use shoulder straps, (b) think ahead and consider the approach technique under poor conditions at a strange field, (c) land short and slow and practice this type of approach for use on short fields, (d) use full flaps with light winds, (e) check landing lights prior to departure. ●

VT

SNJ

VERTICAL TAKEOFF — An SNJ was taxiing out for takeoff and passed behind a C-124 *Globemaster* which began turning up. The SNJ pilot experienced considerable difficulty in maintaining directional control and the tower called the C-124 advising him to "hold it down." The SNJ then began weather-cocking to the left in the slipstream and began rolling backwards. At this point the pilot added full power in an attempt to hold position and the SNJ became airborne in a left turn.

Upon clearing the slipstream of the C-124, the SNJ settled to the ramp tail-high where the propeller struck the ramp. It then proceeded in a direction approximately opposite to the initial taxi course with at least partial and possibly full power on.

Porpoising for about 1000 feet across the warmup area and adjacent sodded area, the SNJ cleared a shallow drainage ditch, entered the parking area in front of operations by passing beneath the wings of two parked C-124s, then settled on the ground in a normal attitude and rolled approximately 1000 feet. The pilot swerved to the right 150 degrees to avoid hitting the operations building before stopping.

The accident board recommended that all pilots constantly observe caution in turning up and in taxiing behind aircraft which are in the turnup position. ●

Aero-Medical

The Cool Treatment

"IT IS noteworthy that there is a definite relationship between the amount and type of clothing worn and the extent of injury," the accident board concluded.

Truth of the accident board's statement as to the protection offered by various types of flight clothing against fire is simply demonstrated by telling what happened to the three men involved in the accident.

In this particular accident which involved a fire, one man was clothed in a summer flight suit (treated with flame retardent compound), intermediate flight jacket, protective helmet and lightweight flying gloves. In leaving the aircraft he passed through an area of intense heat, great enough to melt a nylon sock through his shoe. His summer flight gloves were worn and five holes in the fingers of the gloves matched the five painful, blistered, second-degree burns on his fingers. The cuffs on his gloves were short, resulting in minor wrist burns; minor burns were on his face below his goggles.

The second man wore a summer flight suit over his dungarees, a protective helmet without goggles, a life vest and work shoes. His flight suit had not been treated with a flame retardent and it caught fire and burned along with the dungarees. Severe burns resulted over the exposed portions of the body—hands, face and both ears—and also on the buttocks and left shoulder.

It is believed that if his flight suit had been treated he would not have sustained burns on the body. This suit was issued by the squadron on temporary custody from a flight gear issue pool. The wearer had no way of knowing whether or not it was treated in accordance with existing directives.

The third man was completely unprepared for flight. He wore dungarees, a cotton flight deck sweater, chambray shirt, protective helmet with liner but was without goggles, life vest or high top shoes. The dungarees and sweater afforded absolutely no protection and this man received extensive third-degree burns of hands, face, both lower extremities and second-degree burns of the back.

This was a case of three men traveling approximately the same distance through flames of approximately the same intensity. The first man who was wearing the recommended items of flight clothing received minor burns. After a good night's rest he was ready to return to his squad-

Three in the plane were equally exposed to the fire, yet because of clothing their injuries varied greatly.

ron. The second man received burns requiring prolonged hospitalization and skin grafting. The third man died as a result of his burns one month after the accident.

The reference for treating and handling all cotton summer flight equipment was formerly Technical Order 78-53 and has been redesignated as BuAer Aviation Clothing and Survival Equipment Bulletin 6-55. Two types of summer flight suits are in use and each has different handling technique. Flight suits which have been given a durable flame retardent compound treatment by the manufacturer are identified on the suit label. Non-durable treatment can be done locally and must be reaccomplished at each washing.

Nylon G-suits are specially woven and dyed to make them heat-resistant. Personal nylon clothing should never be worn for flight as untreated nylon has a relatively low melting temperature of 480 degrees.

Goggles and gloves may be uncomfortable at times but their fire protection is more than worth the trouble of procurement and wear.

Preventive medicine is less painful than burns. An ounce of prevention is still worth a pound of cure. ●

G-WHIZ

Are you prepared to take full advantage of your G-suit?

IN general, aviators no longer believe that a G-suit is the traditional trenchcoat of J. Edgar Hoover's agents, and the great majority now consider the bladder-filled unionsuit as a must. However, here are certain factors about G and G-suits which will be of interest to the pilot:

The G-suit helps but does not make a pilot a superman. A pilot wearing a G-suit can pull 6½ G for 30 seconds without blacking out or even graying out while an unprotected pilot will begin to gray out at 4 to 5 G after 4 to 5 seconds. On the other hand, it is quite possible to exceed the protective limits of the suit and endanger the life of the pilot as well as over-stressing the plane. It should be remembered that the tolerances noted above vary between individuals and may vary in an individual pilot from day to day.

A pilot who wears a G-suit is subjected to less fatigue and will maintain a higher degree of combat efficiency following a flight involving relatively low G forces. Note: The test button of the JP-9 anti-G valve can be useful for manually inflating the G-suit during a long, tiring flight to relieve fatigue.

The G-suit may also be used for flotation purposes. Addition of the G-suit automatic actuating, self-sealing disconnect adapter to the end of the hose of the G-suit allows manual inflation of the bladders by depressing the adapter valve and orally inflating the suit. To relieve the pressure in the suit it is necessary only to depress the valve and let the air out. This valve will also keep the water out when used with an anti-exposure suit.

Be careful of accidental actuation of the JP-9 button. Stowage of oxygen masks, hard hats and lunch boxes over this button may result in excessive inflation of the suit. This pressure will be reduced when the improperly stowed gear is removed. Accidental over-inflation can also result from a mechanical failure of the JP-9 valve. This condition can cause extreme discomfort or unconsciousness after a period of time. The pressure may be relieved by disconnecting the suit, but don't forget to depress the automatic actuating, self-sealing disconnect adapter.

Always make sure that the G-suit fits properly. A poorly-fitted suit will not give a pilot the protection he requires. If for instance, the bladder pressure around the waist is improper, an extremely uncomfortable condition would result, and a loose, poorly-fitting suit will seriously restrict the effectiveness of the suit and reduce the protection afforded.

Zippers used in G-suit construction provide a quick convenient means of closing or opening a seam. It is essential that they are kept clean and in free working order. Keep pressures off a partially opened zipper. Tearing slide fastener teeth loose means suit failure, as will holes, rips and stitching failures.

The G-suit is a pilot's personal equipment for his personal safety. It is his personal responsibility. ●

Pilot Maintenance

Even an experienced pilot can have trouble if he's not up to par physically

EVEN the most eager of the tiger-type airplane drivers would curb the urge to roar into the blue behind a reluctant engine whose pistons seemed to be swapping holes.

A 200 rpm mag drop or a 94% rpm reading is usually sufficient indication of an ailing aircraft to warrant a look-see before launching. That sort of thing is just plane sense; you just don't monkey around with machines that need tuning and maintenance.

The fact of the matter is, that sometimes we would like to ease out of a flight because we don't feel too sharp, but we hesitate to open ourselves to the possible comment of "chicken," or maybe we particularly want on that flight.

Any way you cut it, the answer still remains: Your personal maintenance should be even more important than the careful treatment which is lavished on your airplane by a group of the best mechanical doctors in the business.

Now, the Navy regards you as a fairly expensive piece of highly specialized property, and for that reason, you have been provided with medical talent and services which would make a Mayo-Clinic client envious. Your flight surgeon considers you and your well-being one of his very real responsibilities, and he is justifiably concerned if you aren't feeling properly fit.

What really concerns the flight surgeon is the fact that the burden of the preflight check rests with *you*, individually. If you're feeling rocky and attempt to conceal it, chances are he won't be able to read your mind over your coffee cup and diagnose a mild cold, an upset stomach or a seasonal sinus. There just aren't enough instruments built into your frame to give him the necessary readings. So, it remains for you to make your troubles known.

Just remember that illness in flight imposes considerably more stress than on the ground, and flying with a generalized illness aggravates other stresses already present, or may create new ones. For example, fever increases the need for oxygen and increases the susceptibility to anoxia.

In one case in point, a student pilot made a night wheels-up landing in spite of repeated signals from runway radio, tower and wheels watch. This gent was taken from the cockpit apparently unconscious and the flight surgeon made a diagnosis of anxiety reaction, acute. The pilot stated that he was hot, had a headache and experienced difficulty in concentrating. By the third pass he was unable to speak to report his condition and was unable to lift his arm. He added that if he had called the tower on his first or second approach and told them something was wrong, the accident could have been avoided. "I didn't realize that sickness could overwhelm me so suddenly that I would lose complete control of the plane."

The record is discouragingly full of similar accidents, all adding up to the fact that even an experienced pilot, if not up to par physically, can have an accident wherein illness is a contributing factor.

This is positive indication that pilots tend to minimize their illnesses and are not competent judges of their own fitness for flight. That's the flight surgeon's job, and he's always ready and willing to give you the benefit of his skill. Your job is to be sharp enough to recognize when to ask for that help. So, if you don't feel sharp, look sharp for the Doc and you'll be sharp—for a long time. ●

NOTES

from the flight surgeon

POSITION IS EVERYTHING

A pilot recently bailed out of his plane at 18,000 feet with no trouble, but a natural curiosity almost took his nine lives. He looked up at the parachute to watch it open. His neck was jerked violently by the opening shock but he received only a mild muscle strain. He could have broken his neck.

The preferred position for the chute opening is erect, and that includes the head. The feet should be held together and pointed earthward, the spine straight and the arms close to the body. Minimum shock is felt in this position.

WHAT'S NEW

An improved cleaning compound of the Freon-type for oxygen systems has been developed by the Naval Material Center according to the monthly progress report of BuAer's Airborne Equipment Division.

Disposition of a moisture film on the metal parts being cleaned, caused by the high evaporation rate of the previous cleaner, has been eliminated in this compound. The new cleaner, which is nonflammable, non-corrosive, and comparatively non-toxic, has been service evaluated with good results, and specification MIL–C–8638(Aer) for the material has been approved for issue.

New type shoulder harnesses fabricated of Dacron are being installed in both production and delivered aircraft to replace the cotton shoulder harnesses. The new type standard shoulder harness provides improved crash restraint through a reduction of the harness elongation characteristics under load, an increase in ultimate strength and service reliability, and considerably longer shelf life.

ALTITUDE SICKNESS

Altitude sickness is a term which has been around quite a while. Exposure to it, particularly by passengers increases with the higher operational altitudes of aircraft.

The most common symptoms are sleepiness; quickened respiration; hissing or clicking in the ears; a kind of itching skin irritation; pain from air trapped in the stomach, intestines and sinuses or teeth; and bends and chokes.

Bends are severe, aching pains deep in the joints. Chokes are burning sensations in the lungs, accompanied by severe coughing. Blurred vision and headache may also be present.

Altitude sickness in its early stages is not particularly dangerous. There are plenty of pronounced and disagreeable symptoms long before one reaches a lethal limit. The simplest remedy is descent.

DON'T BREAK THE CHAIN

It's good advice, and it's also regulation.

In any consideration of wheels-up landings, the flight surgeon will affirm that you are inviting trouble if you interrupt your established habit patterns—that you should go back and start over in such a situation. And if you're still unconvinced—OpNav Instruction 3750.7 on prevention of wheels-up accidents discusses this. It states:

"Missed approaches and wave-offs: Except under emergency conditions, all aircraft shall be required to leave and re-enter the landing traffic pattern after a missed approach or wave-off in order to afford adequate time *to perform the landing check-off list.*" ●

Maintenance

Sparkplug fouling in reciprocating engines is often caused by improperly

With properly adjusted idle setting it is possible to run an engine at the required minimum RPM or even less for at least five minutes with no signs of fouling the sparkplugs.

In the July issue of *The Approach* the causes and control of sparkplug fouling were discussed in an article titled "Foul Play." It was noted that the majority of cases of sparkplug fouling in reciprocating engines are caused by improperly set idle mixture.

Regarding the subject of idle mixture as it concerns sparkplug fouling: Plug fouling is the inevitable result of failure to provide proper idle mixture setting says the Pratt & Whitney Manual of Engine Operations. The tendency seems to be to adjust the idling mixture on the extremely rich side and to compensate for this by adjusting the throttle stop to a relatively high RPM for minimum idling. General Engine Bulletin 137 scores habitual idling at 1200 to 1500 rpm or taxiing in auto-lean as tending to cover poor maintenance.

AN general specifications for aircraft engines require that service engines be capable of idling at 600 rpm with exhaust stacks, 450 rpm with exhaust collectors. A low idle RPM is necessary for proper control of airplanes taxiing on water and for reduction of wear on brakes and tires of land planes.

With properly adjusted idle setting it is possible to run the engine at the required minimum RPM or even less for at least five minutes with no signs of fouling. Such a setting will result in a minimum of plug fouling, exhaust smoking and loading up and will pay dividends in safety of operation as well as savings from brakes and tires after landing and while taxiing. Idle mixtures should be checked before and after each flight and maintained in correct

IDLE MIXTURE ALSO EFFECTS REVERSABLE PROPS—FOR DETAILS TURN PAGE.

set Idle Mixture

adjustment at all times. The importance of correct idle adjustment cannot be overstressed. Therefore, *The Approach* presents a complete review of idle mixture check procedure:

a. Close throttle

b. Move mixture control toward idle cut-off and observe change of RPM

c. Move mixture control back to automatic rich before engine cuts off

As the mixture control lever is moved toward idle cut-off, and before normal drop-off, one of two things may occur momentarily:

(1) The engine speed may increase by as much as 200 or 300 rpm. An increase of not more than 20 rpm indicates proper mixture strength. A greater increase indicates that the mixture is too rich, as the engine accelerates while the mixture leans out through best power.

(2) The engine speed may not increase, or may drop immediately. This indicates that the idle mixture is too lean, as the fuel-air ratio has straightway leaned out beyond best power.

The idle mixture should be set to give a mixture slightly richer than best power resulting in a 10 to 20 rpm rise after idle cut-off.

This check should be performed with idling speed set at approximately 500 rpm. If the RPM is higher, correct idling adjustment will not result. In addition, the engine cylinder and oil temperatures should be stabilized at a value representing the normal temperatures at which the engine will operate at this RPM.

This check should be performed frequently and necessary adjustments made on new installations, as the diaphragms of new carburetors may not have soaked for a sufficient length of time to obtain their final flexibility. As they become more pliable the idle mixture setting must be adjusted to maintain the desired idling. After the diaphragm has become soaked to a permanent condition it is desirable to check the idle mixture setting regularly to ensure proper ground and flight idling. *Note:* This check must be performed in still air conditions. Any considerable wind, whether head or tail, or across the airplane will affect the results.

Since the metering of the fuel by the carburetor in the idling range is not compensated for altitude, it follows that an idle mixture setting correctly adjusted for one field may not give satisfactory results at some other field of different altitude. If the mixture is correctly set for the lower of two fields, it will tend to be too rich at the higher field; if correctly set for the higher field, it will be too lean for the lower. In the case of an airplane whose flight schedule calls for stops at several fields of different altitudes, it will generally be found possible to make some compromise, intermediate idle mixture setting which will give satisfactory, if not perfect, results at each of the various fields. The tendency of the mixture to be too rich at altitude, and hence to torch and to foul the sparkplugs, may be offset by idling at speeds slightly higher than normal.

It goes without saying too, that using a smooth flow of power or smooth changes of power is most desirable whether taxiing, flying or ground checking. Throttle fiddling will foul sparkplugs. ●

Pilot technique, idle RPM and idle mixture are the key factors in preventing engine stoppage and . . .

Reversing Troubles

Regarding the subject of propeller reversing the *Boeing Field Service News* has the following to say: The merits of reverse thrust are well known. However, unsymmetrical reverse thrust resulting from engine stoppage during propeller reversing could create a dangerous situation.

The following discussion is directed toward avoiding such a situation by pointing out three interrelated factors which affect engine stoppage during propeller reversing. These are: idle RPM, idle mixture and pilot technique.

Reverse Idle RPM: A properly set engine idle RPM, with propeller in forward pitch, along with proper throttle rigging will result in the correct reverse idle RPM. Experience indicates a satisfactory idle of 1100 to 1200 rpm will be obtained if the normal forward idle is set at 700 rpm (for specific model aircraft see E & M Manual) and the throttles are rigged according to the applicable Maintenance Instruction handbooks.

Idle Mixture: Idle mixture affects engine operation in both the reverse and forward thrust conditions. An overly rich idle mixture will lower the power producing ability of the engine. Adhering to the idle mixture adjustment procedures listed in the applicable Maintenance Instruction handbooks will result in sufficient reverse power at the correct reverse RPM to prevent engine stoppage providing the reversing is accomplished at approximately the same altitude, temperature and humidity at which the mixture was set. This will not be true, however, if the airplane is landed at another location of appreciably different ambient conditions than existed when the idle mixture was set. Going to a higher altitude, temperature or humidity results in a richer idle mixture; conversely, going to a lower altitude, temperature or humidity results in a leaner idle mixture. Pilot technique becomes very important in counteracting this phenomenon.

Pilot Technique: When landing under approximately the same ambient conditions as existed when the idle mixture was adjusted, the pilot should have no difficulty with engine stoppage during the propeller reversing cycle, provided the initial engine idle RPM and mixture were correctly set. Power should be applied gradually in the reverse range after ascertaining that all propellers have just passed the flat pitch position (RPM starting to decrease).

When landing at a higher elevation, temperature or humidity than the idle mixture setting conditions, the pilot must apply reverse power just a little more rapidly during the reversing cycle than normal and must carry a small amount of additional power while in reverse to prevent the engine from loading and dying due to too rich an idling mixture.

When landing at a lower elevation, temperature or humidity than the idle mixture setting conditions, the pilot should hesitate longer during the reversing cycle and should apply reverse power a little more slowly to prevent backfiring with resultant engine stoppage or induction system damage.

Mixture control position must always be auto-rich as manual mixture adjustment has practically no effect on idle power until fuel cut-off is reached.

In summary, (1) be sure idle RPM and mixture are correct before takeoff and (2) compensate for ambient condition differences between takeoff and landing by adjusting the reverse power application time delay *through pilot technique.* ●

Effective operations depend on efficient maintenance.

Lack of jack caused this HO3S TILT.

From The Ground Up

Notes and Comments on Maintenance

JACKS TILT! An HO3S was upset while undergoing a 120-hour check. The two main jack pads had jacks under them holding the main landing gear off the deck approximately 1½ inches. The jack under the forward *starboard* jack pad was being raised to get the nosewheel off the deck. This caused the helicopter to tip to the port and fall over on its port side.

Procedures for jacking the main gear of this helicopter as outlined by the applicable E&M manual require the use of jacks under all four jack pads.

Lack of supervision and poor judgment were determined to be the cause of the accident. To prevent the occurrence of accidents of a similar nature this activity has appointed a supervisory crew composed of men experienced in helicopters. ●

DASHPOT DISCREPANCY—"Safety should never be sacrificed for aircraft availability," warned the AAR Board after its investigation of this AD-4N barrier crash. The AD landed at a point aft of number 2 cross-deck pendant but continued up the deck as its tailhook bounced five times without engaging a wire. On the sixth bounce the tailhook caught number 9 wire but the prop had engaged the barrier on the payout. Aircraft damage was minor.

It is believed that improper damping action of the tailhook was the result of the dashpot not having been filled with hydraulic fluid. A new dashpot had been installed in the aircraft the day before. An inspection immediately after the accident found the dashpot only three-quarters full. No leakage was apparent and once refilled it was tested and worked properly.

The dashpot is made up of an upper and lower cylinder with a restricted passage between through which the fluid must pass to the lower cylinder. Although the dashpot appeared full and the upper cylinder overflowed insufficient time was allowed for the fluid to pass through and fill the lower cylinder. This maintenance error would have been detected had it been tested properly, but to meet aircraft commitments and because of the relative difficulty encountered in performing the prescribed damping check, the aircraft was put in an up status with only a damping check from the three-point attitude.

Among its other recommendations the board stressed that continued emphasis be placed on the responsibilities of maintenance and servicing personnel, especially those in a position to supervise and inspect tasks performed by less experienced personnel. ●

KEEP 'EM SAFTIED—The purpose of safetywire on AD exhaust stack clamp bolts has been questioned. The wire is secured around the bolt and then attached to the structure.

Douglas Aircraft explains that at the time

FROM THE GROUND UP, *(Continued)*

of factory installation, the safetywire is installed to serve two purposes. Owing to heat expansion and subsequent expansion of the exhaust bracket, the exhaust clamps are installed loosely. The safetywire prevents the clamps from rotating when the exhaust stacks are cool. In case of exhaust clamp failure, the safetywire also prevents the clamp from falling into the engine section.

In the past, some activities have failed to safetywire the exhaust stack bracket bolts when replacing failed clamps or brackets. This practice should be discouraged. ●

OOPS—NO LID! — The accidental jettisoning of a TV-2 canopy on the ground revealed maintenance defects which may have led to more serious consequences. A log book entry indicated that a BuAer technical directive concerning canopy jettison handle and handle detent, rework of, had been performed. But when this minor accident occurred, investigation revealed that it had not.

This revelation began when the canopy jettison handle was inadvertently placed in the jettison position while the TV was being taxied out for takeoff. The canopy did not jettison and the airplane returned to the line. On securing the engines, the canopy-open switch was energized and at the half-open position, the canopy fired.

On jettisoning, the canopy executed a short parabola and struck the port side of the fuselage and tail. The canopy on jettisoning did not actuate the seat safety release actuator. Both front and rear safety pins were still seated. It is possible to completely actuate the jettison handle and, if binding exists or there is improper adjustment of the canopy down-limit switch, the canopy will not fire until the canopy switch is actuated.

Under these circumstances the ejection seat system was not armed and had an attempt been made to escape from the airplane under emergency flight conditions, use of the ejection seat would not have been available. ●

TIRE SQUAWKS MAY MEAN MONEY—Aircraft tires exhibiting manufacturing defects are a source of significant dollar recovery if prompt adjustment with the manufacturer is undertaken. To facilitate this adjustment, activities are urged *to report each such instance by urgent AMPFUR.* As in the case of all urgent AMPFURs, material should be retained pending receipt of disposition instructions from the Bureau of Aeronautics.

In order for the Navy to get its money's worth on new and recapped aircraft tires, an arrangement was made some years ago with the tire manufacturers wherein they agreed to an adjustment program for defective or failed tires returned to them. This adjustment is based on the percentage of service attained from the tires by the Navy.

The adjustment program needs the cooperation of all activities concerned with the operation of naval aircraft. BuAer must have the facts to obtain the proper dollar credit adjustment; and the Bureau must be able to arrange for prompt return of the faulty tires to the manufacturer.

Activities reporting under the FUR system can provide the necessary cooperation by making all faulty tires the subject of urgent AMPFURs. It is essential that all the background information be provided in the AMPFUR narrative. The required information is outlined in BuAer Instruction NAVAER 00.58A of 20 May 1955.

NO LID revealed important maintenance discrepancy.

The Approach

the Tip-tank

Miscellaneous aviation safety information

NEW NAME

Attention of flight activities is directed to T. O. 9-55, of 11 February '55, which referred to BuAer Notice 5215 establishing Aviation Clothing and Survival Equipment Bulletins. These are for the dissemination of aviator's clothing and survival equipment data. Certain T. O.s and T.N.s were designated ACSEBs and are to be renumbered by activities. Additional information may be had from the NavAer Publications Index, NAV-00-500.

EMERGENCY LANDINGS

Last month there were three emergency landings due to engines running rough and cutting out, according to a Seattle safety officer. In two of these landings the pilots made low dragging approaches. Approaches in single-engine planes with malfunctioning engines must be made so that a landing can be effected from any point in the pattern in event of complete engine failure. You can always slip off excess altitude, but a glide will only stretch into trouble.

GOGGLE-EYED

A single fighter squadron has reported three narrow escapes because of improperly worn goggles. The pilots had put their goggles on top of the protective helmet during catapult shots. The goggles were blown off the helmet, up over the top of the canopy, stretching the elastic band. Each pilot was unaware of this and when he closed the canopy his head was dragged as the goggles were carried forward and wedged between the canopy and the windshield.

In these three known cases the pilots were able to unsnap the goggles from the helmet before the plane was completely out of control.

BEECHCRAFT BRAKES

SNB/JRB pilots (particularly check or instruction pilots) are cautioned against "four-footed braking" by both pilots in dual-brake aircraft. Simultaneous braking by *both* pilots will cause the brake shuttle valve to be centered and thereby prevent braking through *either* system.

EAR PLUG

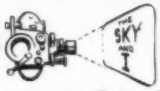
Attention was brought by New York Reservists to the fact that personnel using the ear plugs should be alert to one danger. Specifically, they must be cautioned against leaving the jet turn-up area and failing to remove the ear plugs because of inability to hear noises or shouts of warning of other approaching aircraft.

FLAMEOUT APPROACHES

Flameout approaches often conflict with conventional aircraft on final approach, according to Olathe NATTU. It was pointed out that the conventional aircraft pilots are often unaware that the jet aircraft does not intend to land. Tower control personnel reported that such conflicting traffic often results from the failure of jet aircraft to report high key. It is therefore recommended that all jet pilots practicing flameout approaches complete a tower report between high key and 1500 feet or break off the approach.

Once upon a FLIGHT.... there were 2 PILOTS

They were: YOUNG & HANDSOME

Well, on this FLIGHT, was to take  of ,

who moved ahead so as to present his best

They were in VERY close formation. While was grinding

away, retarded to drop back, and POW! His

aileron was hit by 's tiptank, and WOW! as was flipped

to the left he rolled back to the right and THUMP!

His right tiptank slammed into 's a/c near the cockpit, and

the NASTY old bounced up and hit poor in

the . Then BUMP! rolled over the other a/c and bashed

's right tiptank with his vertical stabilizer, and

WHOOSH! poor lost CONTROL INVERTED before he recovered

control. Then and decided to go HOME.

Cleared for a straight-in approach our heroes executed a snappy

fighter break and (this will kill you) graciously elected to ORBIT while another a/c took off.

Did they get HURT? OH, really now....

These 2 characters came out scented like American Beauties...

UNTIL the Skipper got his pruning

P.S. The turned out real good.

P.S. (2) and didn't.